SUBB1
A18

39. (Amended) The method of Claim 38 wherein said inserting comprises inserting said traffic bursts into said second time slots on said air interface frame format, wherein a respective traffic burst using a highest order modulation mode of said plurality of modulation modes has a duration of one or more of the second time slots, wherein respective traffic bursts using remaining ones of said plurality of modulation modes have a duration that is a multiple of the one or more second time slots.

REMARKS

In the Office Action, the Examiner objected to the drawings under 37 C.F.R. 1.84(p)(4); objected to the drawings under 37 C.F.R. 1.83(a); rejected claims 5 and 8 under 35 U.S.C. § 112, second paragraph, as indefinite; rejected claims 1, 10, 17, 24, and 25 under 35 U.S.C. § 102(e) as anticipated by Moulsley (U.S. Patent No. 6,407,993); rejected claims 2, 3, 18, and 26 under 35 U.S.C. § 103(a) as unpatentable over Moulsley in view of Brickman et al. (U.S. Patent No. 4,328,543); rejected claims 4-7, 27, and 28 under 35 U.S.C. § 103(a) as unpatentable over Moulsley in view of Kolze et al. (U.S. Patent No. 6,285,681); rejected claims 8, 9, 11-13, 29, 30, 38, and 39 under 35 U.S.C. § 103(a) as unpatentable over Moulsley in view of Jasper et al. (U.S. Patent No. 5,533,004); rejected claims 14, 15, 19-23, and 31-37 under 35 U.S.C. § 103(a) as unpatentable over Moulsley in view of Dove et al. (U.S. Patent No. 6,310,891); rejected claim 40 under 35 U.S.C. § 103(a) as unpatentable over Nguyen (U.S. Patent No. 5,025,455) in view of Brickman et al.; rejected claims 41, 42, and 45 under 35 U.S.C. § 103(a) as unpatentable over Nguyen in view of Brickman et al. and Kolze et al.; rejected claim 16 under 35 U.S.C. § 103(a)

as unpatentable over Moulsley in view of Tayebi et al. (U.S. Patent No. 6,373,827); and rejected claims 43 and 44 under 35 U.S.C. § 103(a) as unpatentable over Nguyen in view of Brickman et al. and Beidas et al. (U.S. Patent No. 6,363,131).

By this Amendment, Applicants propose amending Figs. 6, 21, 28, and 30 of the drawings to correct minor informalities. Applicants also amend the specification to improve form, and amend claims 1-3, 5, 8, 12, 24, 26, 35, 38, and 39 to improve form. Applicants respectfully traverse the Examiner's rejections. Claims 1-45 remain pending.

In paragraph 1 of the Office Action, the Examiner alleged that the drawings fail to comply with 37 C.F.R. 1.84(p)(4) due to various informalities. In particular, the Examiner alleged that reference number 606 in Fig. 6 has be used to identify two elements (Office Action, paragraph 1(i)). In response, Applicants have amended the specification and drawings to correct this informality. The Examiner also alleged that reference number 1116 has been used to identify two elements in Fig. 11 (Office Action, paragraph 1(ii)). In response, Applicants have amended the specification to correct this informality. The Examiner also alleged that reference number 930 has been used to identify two elements - one in Fig. 9 and another in Fig. 13 (Office Action, paragraph 1(iii)). In response, Applicants have amended the specification to correct this informality.

The Examiner further alleged that reference number 1810 has been used to identify CB-RX_Data in Fig. 18 and the processor bus in Fig. 21 (Office Action, paragraph 1(iv)). Applicants disagree. With respect to Fig. 18, reference number 1810 identifies an 8-bit data cell bus that includes 8 lines (specification at page 82, lines 15-17). In Fig. 21, reference number

1810 identifies data cell bus 1810 and not the processor bus. The processor bus is separately identified in Fig. 21 by reference number 2110.

In view of the foregoing, Applicants respectfully request that the objection to the drawings under 37 C.F.R. 1.84(p)(4) be reconsidered and withdrawn.

In paragraph 2 of the Office Action, the Examiner alleged that the drawings fail to comply with 37 C.F.R. 1.83(a) due to various informalities. In particular, the Examiner alleged that reference number 3004 is missing from Fig. 30 (Office Action, paragraph 2(i)). In response, Applicants propose amending Fig. 30 to include the reference number. The Examiner also alleged that reference number 2312 is missing from Fig. 30 (Office Action, paragraph 2(ii)). In response, Applicants have amended the specification to include the correct reference number 3012.

The Examiner further alleged that the DS3 transparent SSI module described in the specification on page 18 must be shown in the figures (Office Action, paragraph 2(iii)). Applicants disagree. There is no requirement that every feature described in a specification appear in the drawings. The DS3 transparent SSI module identified by the Examiner is not recited in the claims. Therefore, there is no requirement that it be illustrated in the figures.

The Examiner also alleged that reference number 2810 is missing from the figures (Office Action, paragraph 2(iv)). In response, Applicants propose amending Fig. 28 to include the reference number. The Examiner also alleged that timing multiplexer 1952 is missing from the drawings (Office Action, paragraph 2(v)). In response, Applicants have amended the specification to include the correct reference number 2552. The Examiner further alleged that

reference number 2136 is missing from the Fig. 21 (Office Action, paragraph 2(vi)). In response, Applicants propose amending Fig. 21 to include the reference number. Finally, the Examiner alleged that Fig. 12B identified in the specification is missing (Office Action, paragraph 2(vii)). In response, Applicants have amended the specification to correct the informality.

In view of the foregoing, Applicants respectfully request that the objection to the drawings under 37 C.F.R. 1.83(a) be reconsidered and withdrawn.

In paragraph 6 of the Office Action, the Examiner rejected claims 5 and 8 under 35 U.S.C. § 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. The Examiner alleged that the claims are unclear as to what are multiples of each other. In response, Applicants have amended claims 5 and 8 to clarify that the durations of the traffic bursts are multiples of each other. Accordingly, Applicants respectfully request that the rejection of claims 5 and 8 under 35 U.S.C. § 112 be reconsidered and withdrawn.

In paragraph 8 of the Office Action, the Examiner rejected claims 1, 10, 17, 24, and 25 under 35 U.S.C. § 102(e) as allegedly anticipated by Moulsley. Applicants respectfully traverse the Examiner's rejection.

Moulsley discloses a TDMA frame structure that is suitable for downlink transmissions from a primary station to a secondary station (col. 3, lines 39-41). The frame structure includes multiple frames, each of the same duration, that include a sync sequence indicating the start of

the frame and a header followed by one or more data bursts and possibly a null transmission (col. 3, lines 44-48).

By contrast, the present invention recited in claim 1, for example, includes a combination of features of a multi-modulation mode air interface frame format. The frame format includes an overhead portion, a plurality of overhead bursts, a traffic portion, and a plurality of traffic bursts. The overhead portion includes a first plurality of time slots. The overhead bursts are located within respective ones of the first plurality of time slots. The traffic portion includes a second plurality of time slots following the first plurality of time slots. The traffic bursts are located within one or more of the second plurality of time slots. Each of the traffic bursts are modulated using one of a plurality of modulation modes.

A proper rejection under 35 U.S.C. § 102 requires that a single reference teach every aspect of the claimed invention either expressly or impliedly. Any feature not directly taught must be inherently present. See M.P.E.P. § 2131. Moulsley does not disclose or suggest each of the features recited in claim 1. For example, Moulsley does not disclose an overhead portion that includes a first plurality of time slots.

Instead, Moulsley discloses a header that includes field sizes 10, number of bursts 12, number of addresses in a frame 14, number of addresses in each burst 16, the addresses in each burst 18, and the timing offset of each burst 20 (col. 6, lines 1-10; Fig. 4). Moulsley does not disclose that the header includes any time slots.

The Examiner alleged that Moulsley discloses an overhead section that includes numerous time slots and relied on column 3, lines 38-45, and column 6, lines 2-4, of Moulsley for support (Office Action, page 5). Applicants disagree.

At column 3, lines 38-46, Moulsley discloses:

> FIG. 2 illustrates an example of a TDMA frame structure suitable for use on the downlink transmission from a primary station. The frame structure comprises a plurality of frames, each being of the same duration, for example 5 ms which is a good compromise between efficiency and transmission delay. The downlink frame comprises a sync sequence S indicating the start of the frame, a header H, followed by one or more data bursts DB1 to DB4 and possibly a null transmission NT until the start of the next frame.

Nowhere in this section, or elsewhere, does Moulsley disclose an overhead portion that includes a first plurality of time slots.

At column 6, lines 2-8, Moulsley discloses:

> The header structure comprises 6 concatenated fields 10 to 20, each field serves for indicating field sizes 10, that is, the sizes of the fields 12, 14, 16 and 20, number of bursts 12, number of addresses 14 in a frame, number of addresses in each burst 16, the addresses in each burst 18 and the timing offset of each burst 20, respectively.

This section of Moulsley also does not disclose an overhead portion that includes a first plurality of time slots.

Because Moulsley does not disclose an overhead portion that includes a first plurality of time slots, Moulsley cannot disclose a plurality of overhead bursts that are located within respective ones of the first plurality of time slots, as also recited in claim 1. The Examiner did not address this feature.

For at least these reasons, Applicants submit that claim 1 is not anticipated by Moulsley. Claims 10 and 17 depend from claim 1 and are, therefore, not anticipated by Moulsley for at least the reasons given with regard to claim 1.

Amended independent claim 24 recites features similar to those features described above with regard to claim 1. Claim 24 is, therefore, not anticipated by Moulsley for reasons similar to those given with regard to claim 1. Claim 25 depends from claim 24 and is, therefore, not anticipated by Moulsley for at least the reasons given with regard to claim 24.

In paragraph 10 of the Office Action, the Examiner rejected claims 2, 3, 18, and 26 under 35 U.S.C. § 103(a) as allegedly unpatentable over Moulsley in view of Brickman et al. Applicants respectfully traverse the Examiner's rejection.

Claims 2 and 3 depend from claim 1. The disclosure of Brickman et al. fails to cure the deficiencies in the disclosure of Moulsley as described above with regard to the features of claim 1. For example, Brickman et al. does not disclose an overhead portion that includes a first plurality of time slots or a plurality of overhead bursts located within respective ones of the first plurality of time slots, as recited in claim 1. Instead, Brickman et al. discloses a control field that includes a frame reference burst and five transmit reference bursts (col. 6, lines 38-41). The frame reference burst includes assignment information and is used to maintain frame synchronization (col. 6, lines 41-47). The transmit reference bursts are transmitted by ground stations once every 20 frames and are used to transmit demand requests and maintain transmit clock synchronization (col. 6, lines 48-58).

Therefore, claims 2 and 3 are patentable over Moulsley and Brickman et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1. Claims 2 and 3 are further patentable for reasons of their own.

Claim 3, for example, recites that the plurality of overhead bursts are modulated using quadrature phase shift keying. Neither Moulsley nor Brickman et al. discloses or suggests this feature. The Examiner alleged that Moulsley suggests that the header can contain multiple forms of modulation and this indicates that it is up to the user to determine whether to use only one form of modulation in the header (Office Action, page 7). The portion of Moulsley that the Examiner appears to be relying on is found at column 4, lines 55-63. Nowhere in this section of Moulsley, or elsewhere, does Moulsley disclose modulating the header using quadrature phase shift keying. For at least these additional reasons, Applicants submit that claim 3 is patentable over Moulsley and Brickman et al., whether taken alone or in any reasonable combination.

Independent claim 18 recites features similar to the features described above with regard to claim 1. As explained above, the disclosure of Brickman et al. fails to cure the deficiencies in the disclosure of Moulsley described above with regard to the features of claim 1. Therefore, claim 18 is patentable over Moulsley and Brickman et al., whether taken alone or in any reasonable combination, for reasons similar to those given with regard to claim 1.

Claim 26 depends from claim 24. The disclosure of Brickman et al. does not cure the deficiencies in the disclosure of Moulsley with regard to the features of claim 24. Therefore, claim 26 is patentable over Moulsley and Brickman et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 24.

In paragraph 11 of the Office Action, the Examiner rejected claims 4-7, 27, and 28 under 35 U.S.C. § 103(a) as allegedly unpatentable over Moulsley in view of Kolze et al. Applicants respectfully traverse the Examiner's rejection.

Claims 4-7 depend from claim 1. The disclosure of Kolze et al. fails to cure the deficiencies in the disclosure of Moulsley as described above with regard to the features of claim 1. For example, Kolze et al. does not disclose an overhead portion that includes a first plurality of time slots or a plurality of overhead bursts located within respective ones of the first plurality of time slots, as recited in claim 1. Instead, Kolze et al. discloses overhead fields that include a guard time, a ramp up, a preamble, a BRF byte, a sequence number, a FEC parity, and a ramp down (Abstract; Figs. 2-5).

Therefore, claims 4-7 are patentable over Moulsley and Kolze et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Claims 27 and 28 depend from claim 24. The disclosure of Kolze et al. does not cure the deficiencies in the disclosure of Moulsley with regard to the features of claim 24. Therefore, claims 27 and 28 are patentable over Moulsley and Kolze et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 24.

In paragraph 12 of the Office Action, the Examiner rejected claims 8, 9, 11-13, 29, 30, 38, and 39 under 35 U.S.C. § 103(a) as allegedly unpatentable over Moulsley in view of Jasper et al. Applicants respectfully traverse the Examiner's rejection.

Claims 8, 9, and 11-13 depend from claim 1. The disclosure of Jasper et al. fails to cure the deficiencies in the disclosure of Moulsley as described above with regard to the features of claim 1. For example, Jasper et al. does not disclose an overhead portion that includes a first plurality of time slots or a plurality of overhead bursts located within respective ones of the first plurality of time slots, as recited in claim 1. Therefore, claims 8, 9, and 11-13 are patentable

over Moulsley and Jasper et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Claims 29 and 30 depend from claim 24. The disclosure of Jasper et al. does not cure the deficiencies in the disclosure of Moulsley with regard to the features of claim 24. Therefore, claims 29 and 30 are patentable over Moulsley and Jasper et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 24.

Amended independent claim 38 recites features similar to the features described above with regard to claim 1. As explained above, the disclosure of Jasper et al. does not cure the deficiencies in the disclosure of Moulsley described above with regard to the features of claim 1. Therefore, claim 38 is patentable over Moulsley and Jasper et al., whether taken alone or in any reasonable combination, for reasons similar to those given with regard to claim 1.

Claim 39 depends from claim 38 and is, therefore, patentable over Moulsley and Jasper et al. for at least the reasons given with regard to claim 38.

In paragraphs 13 and 14 of the Office Action, the Examiner rejected claims 14, 15, 19-23, and 31-37 under 35 U.S.C. § 103(a) as allegedly unpatentable over Moulsley in view of Dove et al. Applicants respectfully traverse the Examiner's rejection.

Claims 14 and 15 depend from claim 1. The disclosure of Dove et al. fails to cure the deficiencies in the disclosure of Moulsley as described above with regard to the features of claim 1. For example, Dove et al. does not disclose an overhead portion that includes a first plurality of time slots or a plurality of overhead bursts located within respective ones of the first plurality of time slots, as recited in claim 1. Therefore, claims 14 and 15 are patentable over Moulsley

and Dove et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Independent claim 19 recites features similar to the features described above with regard to claim 1. As explained above, the disclosure of Dove et al. does not cure the deficiencies in the disclosure of Moulsley described above with regard to claim 1. Therefore, claim 19 is patentable over Moulsley and Dove et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 1.

Claims 20-23 depend from claim 19 and are, therefore, patentable over Moulsley and Dove et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 19.

Claims 31-34 depend from claim 24. The disclosure of Dove et al. fails to cure the deficiencies in the disclosure of Moulsley described above with regard to the features of claim 24. Therefore, claims 31-34 are patentable over Moulsley and Dove et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 24.

Amended independent claim 35 recites features similar to the features described above with regard to claim 24. As explained above, the disclosure of Dove et al. does not cure the deficiencies in the disclosure of Moulsley described above with regard to the features of claim 24. Therefore, claim 35 is patentable over Moulsley and Dove et al., whether taken alone or in any reasonable combination, for reasons similar to those given with regard to claim 24.

Claims 36-37 depend from claim 35 and are, therefore, patentable over Moulsley and Dove et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 35.

In paragraph 15 of the Office Action, the Examiner rejected claim 40 under 35 U.S.C. § 103(a) as allegedly unpatentable over Nguyen in view of Brickman et al. Applicants respectfully traverse the Examiner's rejection.

Nguyen discloses a system in which a different unique word is modulated in each inphase and quadrature channel (I and Q) during transmission of the preamble of a message (col. 1, lines 16-18).

Brickman et al. discloses a TDMA frame that includes control and traffic fields (col. 6, lines 31-33). The control field includes a frame reference burst and five transmit reference bursts (col. 6, lines 38-41). The frame reference burst includes assignment information and is used to maintain frame synchronization (col. 6, lines 41-47). The transmit reference bursts are transmitted by ground stations once every 20 frames and are used to transmit demand requests and maintain transmit clock synchronization (col. 6, lines 48-58).

By contrast, the present invention recited in claim 40 includes a combination of features of a traffic burst for a burst mode communications link. The traffic burst includes a preamble portion and a data portion following the preamble portion. The preamble portion includes a first unique word, a second unique word, and a data/spare section in between the first unique word and the second unique word, where the data/spare section defines a preamble split length. The data portion contains data.

Neither Nguyen nor Brickman et al., whether taken alone or in any reasonable combination, discloses or suggests this claimed combination. For example, neither Nguyen nor Brickman et al. discloses or suggests a data/spare section in between a first unique word and a second unique word, where the data/spare section defines a preamble split length.

The Examiner alleged that Nguyen discloses a preamble that includes two unique words (Office Action, page 12). The Examiner admitted that Nguyen does not disclose a data/spare section between the two unique words, but relied on Brickman et al. for allegedly disclosing a guard space, as a data/spare section, between a number of fields in the control field (Office Action, page 12). Applicants disagree.

Contrary to the Examiner's assertion, Brickman et al. does not disclose a data/spare section. The guard time identified by the Examiner is not the equivalent of the claimed data/spare section. As described in the specification at page 38, the claimed data/spare section may store data and/or spares. The guard time described by Brickman et al. does not store data or spares.

Even if the guard time of Brickman et al. was construed to be equivalent to the claimed data/spare section, Applicants submit that one of ordinary skill in the art would not have found it obvious to insert the guard time between the unique words identified by Nguyen. The Examiner alleged that it would have been obvious to make the combination "so that frame timing can be recovered," "to accommodate the two unique word's synchronization purposes," and "[to avoid] overlapping transmission" (Office Action, pages 12-13). Applicants submit that the Examiner's allegation lacks support. The Examiner has cited no portion of either Nguyen or Brickman et al.

that provides motivation for making the alleged modifications. Also, the Examiner has provided no evidence that by inserting a data/spare section between first and second unique words would aid in the recovery of frame timing, accommodate synchronization, or avoid overlapping transmission, as alleged. For at least these reasons, the rejection does not satisfy the requirements of 35 U.S.C. § 103.

For at least the foregoing reasons, Applicants submit that claim 40 is patentable over Nguyen and Brickman et al., whether taken alone or in any reasonable combination.

In paragraph 16 of the Office Action, the Examiner rejected claims 41, 42, and 45 under 35 U.S.C. § 103(a) as allegedly unpatentable over Nguyen in view of Brickman et al. and Kolze et al. Applicants respectfully traverse the Examiner's rejection.

Claims 41 and 42 depend from claim 40. The disclosure of Kolze et al. fails to cure the deficiencies in the disclosures of Nguyen and Brickman et al. as described above with regard to the features of claim 40. For example, Kolze et al. does not disclose a data/spare section in between a first unique word and a second unique word, where the data/spare section defines a preamble split length, as recited in claim 40. Therefore, claims 41 and 42 are patentable over Nguyen, Brickman et al., and Kolze et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 40.

Independent claim 45 recites features similar to the features described above with regard to claim 40. As explained above, the disclosure of Kolze et al. does not cure the deficiencies in the disclosures of Nguyen and Brickman et al. described above with regard to the features of claim 40. Therefore, claim 45 is patentable over Nguyen, Brickman et al., and Kolze et al.,

whether taken alone or in any reasonable combination, for reasons similar to those given with regard to claim 40.

In paragraph 17 of the Office Action, the Examiner rejected claim 16 under 35 U.S.C. § 103(a) as allegedly unpatentable over Moulsley in view of Tayebi et al. Applicants respectfully traverse the Examiner's rejection.

Claim 16 depends from claim 1. The disclosure of Tayebi et al. fails to cure the deficiencies in the disclosure of Moulsley as described above with regard to the features of claim 1. For example, Tayebi et al. does not disclose an overhead portion that includes a first plurality of time slots or a plurality of overhead bursts located within respective ones of the first plurality of time slots, as recited in claim 1. Therefore, claim 16 is patentable over Moulsley and Tayebi et al., whether taken alone or in any reasonable combination, for at least the reasons given with respect to claim 1.

In paragraph 18 of the Office Action, the Examiner rejected claims 43 and 44 under 35 U.S.C. § 103(a) as allegedly unpatentable over Nguyen in view of Brickman et al. and Beidas et al. Applicants respectfully traverse the Examiner's rejection.

Claims 43 and 44 depend from claim 40. The disclosure of Beidas et al. fails to cure the deficiencies in the disclosures of Nguyen and Brickman et al. as described above with regard to the features of claim 40. For example, Beidas et al. does not disclose a data/spare section in between a first unique word and a second unique word, where the data/spare section defines a preamble split length, as recited in claim 40. Therefore, claims 43 and 44 are patentable over

Nguyen, Brickman et al., and Beidas et al., whether taken alone or in any reasonable combination, for at least the reasons given with regard to claim 40.

In view of the foregoing amendments and remarks, Applicants respectfully request the Examiner's reconsideration of the application and the timely allowance of pending claims 1-45.

If the Examiner does not believe that all pending claims are now in condition for allowance, the Examiner is urged to contact the undersigned to expedite prosecution of this application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0383 and please credit any excess fees to such deposit account.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES

IN THE SPECIFICATION:

The specification has been amended as follows:

The paragraph beginning at page 37, line 4, has been amended as follows:

Referring next to [FIGS.] FIG. 6, a diagram of a traffic burst format used in the air interface frame format of FIG. 5 is shown including a split preamble feature. The traffic burst 600 includes: a preamble 602 containing guard [606] 607, ramp 608, first unique word 610, second unique word 611, a first data/spare section 612, and a second data/spare section 614; data section 604; and a parity 606. Also shown is the preamble split length 613.

The paragraph beginning at page 37, line 27, has been amended as follows:

The preamble 602 of the traffic burst 600 contains entirely known sections including the guard [606] 607, and ramp 608. However, the preamble 602 is unique in that instead of one unique word that would be used in a prior art preamble, the preamble is a "split preamble" in which the unique word is divided into a first unique word 610 and a second unique word 611. The first unique word 610 and the second unique word 611 are separated by the first data/spare section 612.

The paragraph beginning at page 53, line 28, has been amended as follows:

The modulation selector unit 1114 is the component of the multi-modulation modem 1100 that enables the multiple modulations to be used. The symbol-to-byte converter [1116]

1166, which is coupled to the burst formatter 1118. The byte-to-symbol converter [1116] 1166 is programmable and converts the bytes to modulation symbols needed for the particular modulation each burst will be modulated with (e.g. QPSK, 16-QAM, and 64-QAM). The burst formatter 1118 is coupled to the constellation lookup 1120. The burst formatter 1118 formats the symbols to a burst type, such as a quad burst or a single burst as discussed in FIGS. 7A and 7B. A preamble and post-amble can be appended to the burst by the burst formatter 1118 as well. The constellation lookup 1120 is programmable and formats the burst according to one of the three constellations it is configured for: 4 (QPSK), 16 (16-QAM), or 64 (64-QAM). The constellations are programmable and are not limited to square constellations. Constellations such as multi-level circular 64 point constellations may be used. Thus, advantageously, the modulation selector unit 1114 can format the bursts using a plurality of modulations on a burst-by-burst basis. This represents an improvement over the prior art modems which only modulate using one modulation.

The paragraph beginning at page 64, line 20, has been amended as follows:

Each hub terminal 1302 (sector radio) includes a main outdoor unit 1304 having an antenna 1306 coupled to a main indoor unit 1314 via an intrafacility link 1312 (IFL). Also shown are the backup outdoor unit 1308 having an antenna 1310 coupled to the backup indoor unit 1316 via an intrafacility link 1312. The backup indoor unit 1316 (IDU) has the same connections as the main IDU 1314; thus, only the main indoor unit 1314 will be discussed. Each main indoor unit 1314 has one DS3 line 1324 to the TDM Multiplexer 1318 and one OC3c line

1326 to the ATM Multiplexer 1320. The TDM Multiplexer 1318 and the ATM Multiplexer 1320 each have backhaul lines 1332 allowing connection to a transport network (not shown). Each main indoor unit 1314 of each hub terminal 1302 is coupled to the LAN hub 1328 and the timing source 1322. The timing source 1322 sends the timing reference signal 1334 to each hub terminal 1302. The LAN router 1328 has an optional WAN line [930] 1330 to the EMS.

The paragraph beginning at page 77, line 33, has been amended as follows:

The multi-transport mode cell bus 1100 also operates at a fixed frequency that matches the air interface symbol rate. For example, if the air interface operates at a symbol rate of 10 Msps, then the multi-transport mode cell bus 1510 operates at 10 Mbps. At the hub terminal, the timing for the multi-transport mode cell bus 1510 is derived from a timing reference or link to the transport network as described in FIG. 13. At the remote terminal, the timing for the multi-transport cell bus 1510 is derived from the signaling sent from hub terminal. The CB-Data section 1518 comprises fixed length data timeslots 1526. Advantageously, the data timeslots 1526 are configured such that they may carry both specially formatted TDM cells and ATM cells, which are described in FIGS. 28 and 29, on the same bus frame format 1512. Again, this is a departure from the prior art wherein separate bus frame formats are used for ATM and TDM transport. The structure of the IM-Com cells that fit within each message timeslot 1528 of the IM-Com section 1516 and the structure of the CB-Data cells that fit within each data timeslot 1526 of the CB-Data section 1518 are discussed with reference to FIGS. 16 and 17, respectively. Thus, as will be described in [FIG. 12B] FIGS. 16 and 17, the CB-Data cells that fit within the

data timeslots 1526 of the CB-Data section 1518 are designed to carry either ATM cells or specially designed TDM cells.

The paragraph beginning at page 106, line 16, has been amended as follows:

Referring next to FIG. 25A and 25B, a block diagram is shown for a multi-transport mode SSI module that is used in the remote terminal shown in FIG. 2. The multi-transport mode SSI module 2500 handles both synchronous traffic (TDM) and asynchronous traffic (ATM) and contains the multi-transport mode cell bus 2502, TDM cell formatter 2504 (TDM signal formatter), ATM cell formatter 2506 (ATM signal formatter), message buffer 2508, ATM timeplan and filter memory 2510, receive buffer 2512, transmit buffer 2514, PCM buffer controller 2516, PCM serial bus 2518, first utopia I bus 2520, second utopia I bus 2521, input/output (IO) bus 2522, AAL5 SAR 2524, AAL5 buffer 2526, AAL1 SAR 2528, AAL1 buffer 2530, central processing unit (CPU) 2532, PCI bridge 2538, PCI bus 2540, high-level data link control (HDLC) controller 2542, ROM bus 2544, Frame Relay serial bus 2546, CES serial bus 2548, LAN controller 2550 (shown in FIG. 25B for multi-transport mode SSI module 2501), timing multiplexer [1952] 2552 , T1/E1 framers 2554.

The paragraph beginning at page 119, line 9, has been amended as follows:

Referring next to FIG. 28, a block diagram is shown for an Asynchronous Transfer Mode (ATM) cell 2800 used in the point to multipoint system of FIG. 2. The ATM cell 2800 is a standard cell known in the art and has a header section 2802 and a data section 2804. The header

section 2802 contains a virtual path identifier (VPI) 2806, a virtual channel identifier (VCI) 2808, and other [headers] header fields 2810. The standard ATM cell 2800 is 53 bytes in length. The header section 2802 is five bytes and the data section 2804 is 48 bytes. The header section carries standard information, such as the VPI, VCI and other headers known in the art. The VPI 2806 is 8 bits and identifies the virtual path and the VCI 2808 is 16 bits and identifies the virtual channel. The VPI and VCI are inserted at the ATM formatter of the ATM-based SSI modules at the hub terminal so that the ATM-based SSI modules of the remote terminal can retrieve the proper ATM cells.

The paragraph beginning at page 119, line 27, has been amended as follows:

Referring next to FIG. 29, a block diagram is shown for a time-division-multiplexed cell (hereinafter referred to as a TDM cell 2900) used in one embodiment of the point to multipoint system. The TDM cell 2900 has a data section [2902] 2904 and a header section [2904] 2902 containing a virtual path identifier (VPI) 2906, and other headers 2908. Note that the TDM cell 2900 can also be referred to as a TDM packet; however, the specification refers to it as a TDM cell since it is being modeled after an ATM cell. Additionally, the ATM cells 2800 and TDM cells 2900 can be referred to generically as ATM signals and TDM signals.

The paragraph beginning at page 121, line 19, has been amended as follows:

Referring next to FIG. 30, a block diagram is shown for an ATM address filtering function that is performed at every ATM-based SSI module, such as shown in FIGS. 20, 22, 25A

and 25B at the remote terminals. Corresponding steps from FIGS. 31A and 31B, which illustrate the steps performed in the ATM address filtering techniques at the ATM-based SSI modules, will be referred to while referring to FIG. 30. The ATM address filtering diagram 300 shows a multi-transport mode cell bus 3002, ATM formatter 3004 (or ATM signal formatter) containing a VPI compare 3006, an optional VPI lookup table 3007 and optional VPI accept/discard bit 3009 (for the ATM-OC3c SSI module of FIG. 22), buffer 3008 containing a VCI lookup table 3010, Utopia bus [2312] 3012, and a TDM cell formatter 3022 (or TDM signal formatter). The VCI lookup table 3010 has an VCI accept/discard bit 3016, AAL1/AAL5 bit 3018, and a second 8 bit portion 3020. The VPI compare 3006 includes the extracted VPI 3024, a register 3026, and a comparator 3028. Also shown are an AAL1 SAR 3013 and an AAL5 SAR 3014.

The paragraph beginning at page 122, line 3, has been amended as follows:

The multi-transport mode cell bus 3002 is coupled to the ATM formatter 3004 and the TDM cell formatter 3022. The ATM formatter 3004 contains the VPI compare 3006 and the optional VPI lookup table 3007. The ATM formatter 3004 is coupled to the buffer 3008, Utopia bus [2312] 3012. The buffer 3008 contains the VCI lookup table 3010. The ATM formatter 3004 and the TDM cell formatter 3014 are both custom logic devices.

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) A multi-modulation mode air interface frame format comprising:

an overhead portion including a first plurality of time slots;

a plurality of overhead bursts located within respective ones of the first plurality of time slots;

a traffic portion including a second plurality of time slots following the first plurality of time slots; and

a plurality of traffic bursts, wherein [respective] ones of the plurality of traffic bursts are located within one or more of the second plurality of time slots, wherein each of the plurality of traffic bursts are modulated using [a respective] one of a plurality of modulation modes.

2. (Amended) The frame format of Claim 1 wherein [said each of] said plurality of overhead bursts are modulated using only one of said plurality of modulation modes.

3. (Amended) The frame format of Claim 2 wherein [said each of] said plurality of overhead bursts are modulated using quadrature phase shift keying.

5. (Amended) The frame format of Claim 4 wherein [a duration] <u>durations</u> of [respective] ones of said plurality of traffic bursts, comprising [respective] ones of said plurality of burst types, are multiples of each other.

8. (Amended) The frame format of Claim 1 wherein [said respective] ones of said plurality of traffic bursts using [respective] ones of said plurality of modulation modes have [a

duration] durations that [is a multiple] are multiples of durations of one or more of other ones of said plurality of traffic bursts using other [respective] ones of said plurality of modulation modes.

12. (Amended) The frame format of Claim 1 wherein [the] durations of [said respective] ones of said plurality of traffic bursts using said respective ones of said plurality of modulation modes are respective multiples of the duration of a traffic burst modulated by a highest order modulation mode of said plurality of modulation modes.

24. (Amended) A method of transmitting bursts over an air interface comprising:

creating a multi-modulation air interface frame format comprising a plurality of overhead time slots for containing overhead bursts and a plurality of traffic time slots for containing traffic bursts;

formatting traffic signals into the traffic bursts within the multi-modulation air interface frame format;

modulating each of the traffic bursts using a respective one of a plurality of modulation modes on a burst by burst basis; and

transmitting the traffic bursts on the multi-modulation air interface frame format over the air interface.

26. (Amended) The method of Claim 24 further comprising:

formatting overhead signals into the overhead bursts within said multi-modulation air interface frame format; and

modulating the overhead bursts on said multi-modulation air interface frame format using only one of said plurality of modulation modes.

35. (Amended) A method of transmitting bursts over an air interface comprising:

creating a multi-transport mode air interface frame format having a plurality of first time slots for containing overhead bursts and a plurality of second time slots for containing traffic bursts;

formatting traffic signals into the traffic bursts within the multi-transport mode air interface frame format, wherein the traffic signals comprise a plurality of transport mode traffic signals;

modulating each of the traffic bursts; and

transmitting the traffic bursts on the multi-transport mode air interface frame format over the air interface.

38. (Amended) A method of formatting traffic bursts for an air interface frame format comprising:

formatting signals into overhead bursts and traffic bursts;

modulating the traffic bursts using one of a plurality of modulation modes;

inserting the overhead bursts into first time slots on an air interface frame format; and

inserting the traffic bursts into second time slots on [an] the air interface frame format, wherein the traffic bursts modulated with respective ones of the plurality of modulation modes comprise a different number of the second time slots on the air interface frame format.

39. (Amended) The method of Claim 38 wherein said inserting comprises inserting said traffic bursts into said second time slots on said air interface frame format, wherein a respective traffic burst using a highest order modulation mode of said plurality of modulation modes has a duration of one or more of the second time slots, wherein respective traffic bursts using remaining ones of said plurality of modulation modes have a duration that is a multiple of the one or more second time slots.

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